

CLAIMS

1. An isolated and purified antigen which is expressed by a wild-type *E. risticii* strain and is specific to the wild-type *E. risticii* strain.

5 2. The antigen of Claim 1, which stimulates a protective immune response against infection by the wild-type *E. risticii* strain when a host is immunized with the antigen.

3. The antigen of Claim 1, which stimulates a protective immune response against infection by at least one other wild-type *E. risticii* strain when a host is immunized with the antigen.

10 4. The antigen of Claim 1, which has a molecular weight of about 40 to about 90 kDa.

5. The antigen of Claim 1, which is expressed by *E. risticii* strain 25-D.

6. The antigen of Claim 1, which is expressed by *E. risticii* strain 90-12.

7. The antigen of Claim 1, which is expressed by ATCC type *E. risticii* strain.

8. The antigen of Claim 1, which comprises the amino acid sequence shown in Figure

15 2.

9. The antigen of Claim 1, which comprises the amino acid sequence shown in Figure

3

10. The antigen of Claim 1, which comprises the amino acid sequence shown in Figure 4.

11. An isolated and purified nucleic acid encoding the antigen of Claim 1.

12. An expression vector comprising the nucleic acid of Claim 6.

13. A host cell transformed with the expression vector of Claim 12, wherein the transformed host produces the antigen.

5 14. A method of producing an antigen which is expressed by a wild-type *E. risticii* strain and is specific to the wild-type *E. risticii* strain, comprising culturing the transformed host cell of Claim 13 in a suitable culture medium, and isolating the antigen.

15. An immunogenic pharmaceutical composition, comprising the antigen of Claim 1 and a pharmaceutically acceptable carrier.

10 16. A method of inducing an immune response, comprising administering an effective amount of the immunogenic composition of Claim 15 to a host.

17. An isolated and purified protein comprising an amino acid sequence selected from the group consisting of the amino acid sequence recited in Figure 2, the amino acid sequence recited in Figure 3 and the amino acid sequence recited in Figure 4.

15 18. The protein of Claim 17, comprising the amino acid sequence recited in Figure 2.

19. The protein of Claim 17, comprising the amino acid sequence recited in Figure 3.

20. The protein of Claim 17, comprising the amino acid sequence recited in Figure 4.

21. The protein of Claim 17, which consists of said amino acid sequence.

22. An isolated and purified nucleic acid encoding the protein of Claim 17.

23. An expression vector comprising the nucleic acid of Claim 22.

24. A host cell transformed with the expression vector of Claim 23, wherein the transformed host produces the protein.

5 25. A method of producing a protein, comprising culturing the transformed host cell of Claim 24 in a suitable culture medium, and isolating the antigen.

26. An immunogenic pharmaceutical composition, comprising the protein of Claim 17 and a pharmaceutically acceptable carrier.

10 27. A method of inducing an immune response, comprising administering an effective amount of the immunogenic composition of Claim 26 to a host.